

# Partners for Child Passenger Safety Fact and Trend Report

October 2006



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## *Partners for* Child Passenger Safety

Neighbors working together

The 2006 Partners for Child Passenger Safety (PCPS) Fact and Trend Report provides current data about children involved in U.S. motor vehicle crashes. In its second year, this report focuses on child injury. In particular, we highlight the circumstances, people and vehicles that are involved in crashes in which children are injured.

PCPS, the world's largest study of children in crashes, is a research partnership between The Children's Hospital of Philadelphia and State Farm Insurance Companies. As of Dec. 31, 2005, more than 455,000 State Farm customers, transporting 669,000 children, participated in the study. The study includes 29,675 in-depth interviews and more than 800 crash investigations. (See page 11 for information about study design and data and definitions of technical terminology.)

PCPS data continue to reinforce the need for ongoing education on appropriate restraint use and rear seating for children. The study also points to the need for continued research and development as well as the adoption of public policies to support the unique needs of child passengers. The data on teenage drivers support the need for additional research and the implementation of interventions to improve driving skills and laws.

Please contact Tracey Hewitt ([durhamt@email.chop.edu](mailto:durhamt@email.chop.edu)) with any questions about the uses and/or interpretation of the data.

*PCPS, the world's largest study of children in crashes, is a research partnership between The Children's Hospital of Philadelphia and State Farm Insurance Companies®.*

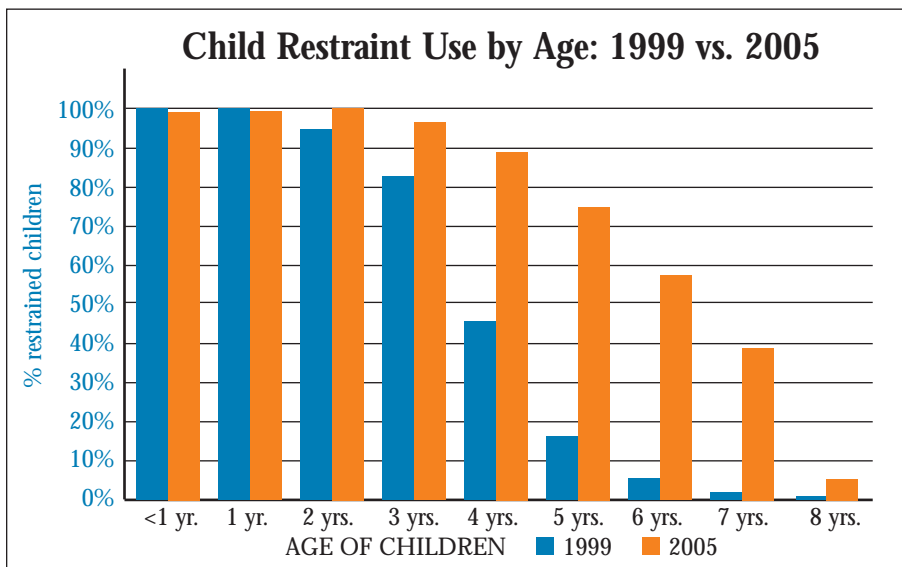
## 1. BACKGROUND

### Laws in PCPS States as of June 2006\*

State	Must Be in Child Restraint	Booster Seat Law
Michigan	3 years and younger	No
Ohio	3 years and younger or less than 40 lbs.	No
Arizona	4 years and younger	No
Texas	4 years and younger and less than 36 inches	No
Maryland	5 years and younger or 40 lbs.	effective 10/1/03
California	5 years and younger or 60 lbs.	effective 1/1/02
Nevada	5 years and younger and 60 lbs.	effective 6/1/04
Virginia	5 years and younger	effective 1/1/04
Delaware	6 years and younger and 60 lbs	effective 1/1/03
New York	6 years and younger and 4'9"	effective 3/29/05
District of Columbia	7 years and younger	effective 10/16/02
Illinois	7 years and younger	effective 1/1/04
Indiana	7 years and younger	effective 7/1/05
North Carolina	7 years and younger and less than 80 lbs.	effective 1/1/05
Pennsylvania	7 years and younger	effective 2/21/03
West Virginia	7 years younger and less than 4'9"	effective 7/6/05

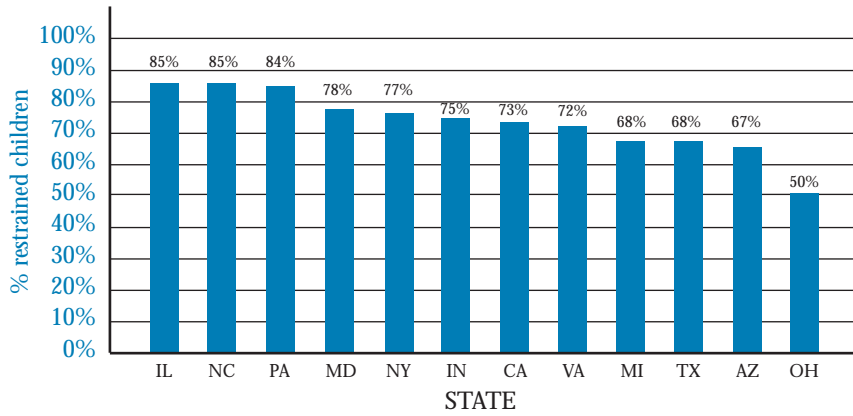
\* Information on child restraint laws is available on the Insurance Institute for Highway Safety Web site, [www.hwysafety.org](http://www.hwysafety.org). PCPS states are those in which PCPS collects data on children in crashes.

## 2. RESTRAINT USE AND SEATING



- This graph compares *restrained* children riding in *any type of child restraint system* (CRS) in 1999 vs. 2005.
- For all children through age 8, child restraint use has increased from 51% in 1999 to 73% in 2005.
- Child restraint use among children 4 to 8 years old has increased from 15% in 1999 to 54% in 2005.
- The greatest increases in child restraint use were among 4- to 7-year-olds.
- *All children younger than 9 years should be restrained in child restraint systems.*

### Child Restraint Use by State, 0 to 8 years: 2005

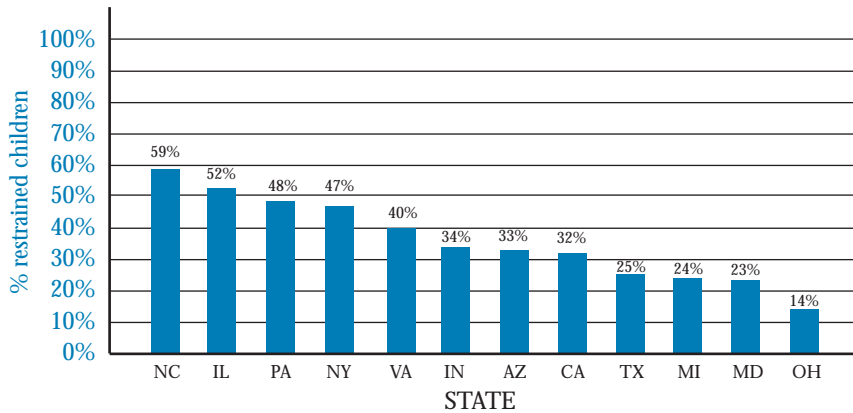


- In PCPS states, 99.5% of children from birth to 3 years were in child restraints.
- Only 54% of children ages 4 through 8 years were in child restraints.
- For Delaware, the District of Columbia, Nevada and West Virginia, sample populations were too small to include.

#### State Abbreviations

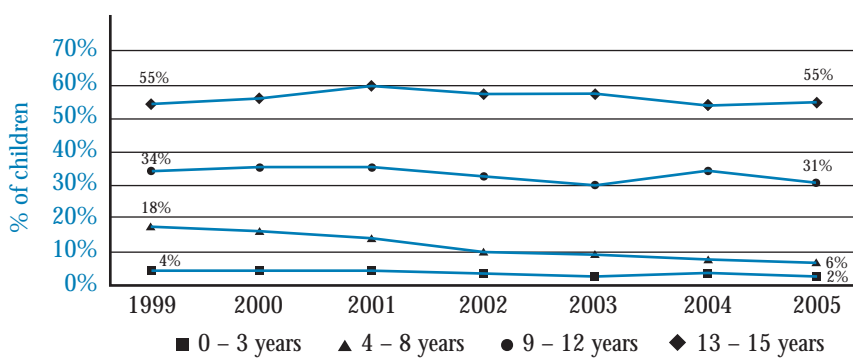
AZ - Arizona	NC - North Carolina
CA - California	NY - New York
IL - Illinois	OH - Ohio
IN - Indiana	PA - Pennsylvania
MD - Maryland	TX - Texas
MI - Michigan	VA - Virginia

### Booster Seat Use by State, 4 to 8 years: 2005



- Overall, 36% of children ages 4 through 8 years are riding in belt-positioning booster seats.
- Three of the four states with the lowest booster seat use, Ohio, Michigan and Texas, do not have booster seat laws.
- The top three states, North Carolina, Illinois and Pennsylvania, have booster seat laws through age 7.
- For Delaware, the District of Columbia, Nevada and West Virginia, sample cells were too small to include reliable estimates.

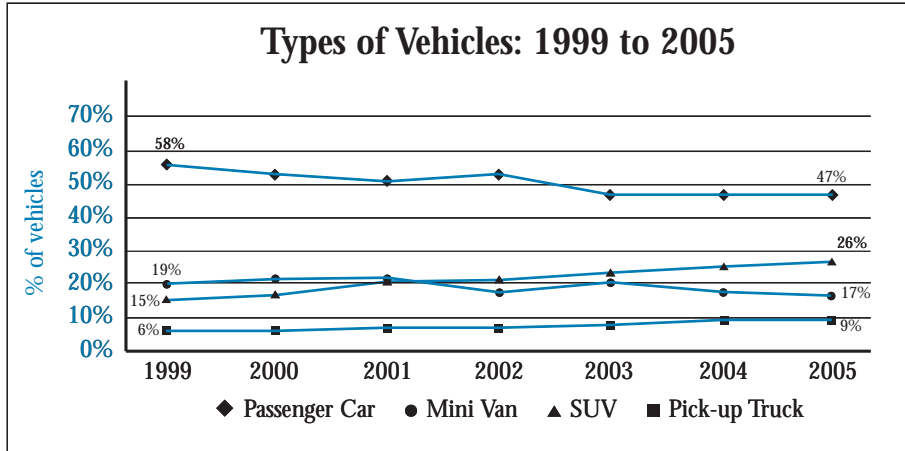
### Children Riding in Front Seat: 1999 – 2005



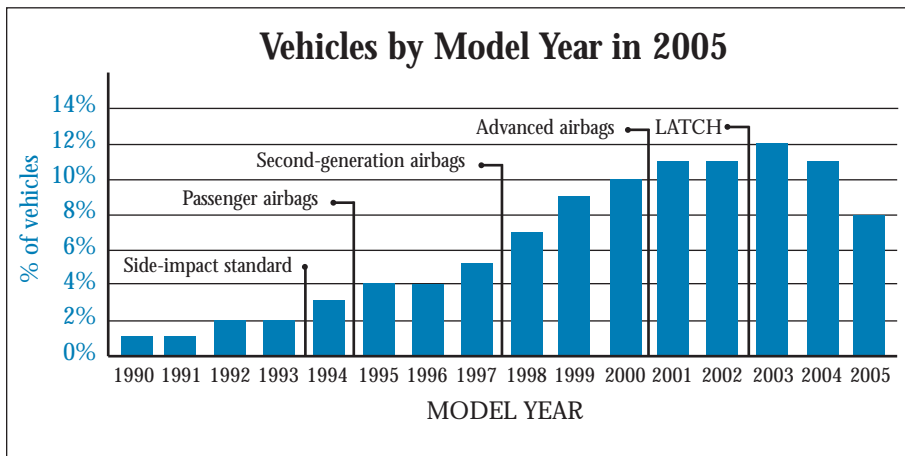
- The proportion of 4- to 8-year-olds riding in the front seat declined from 18% in 1999 to 6% in 2005.
- In 2005, 11% of children younger than age 13 were riding in the front seat. Of these, 77% were in the 9- to 12-year age group.
- Sixteen of every 1,000 children in crashes were exposed to a deployed airbag in 2005.

### 3. VEHICLES

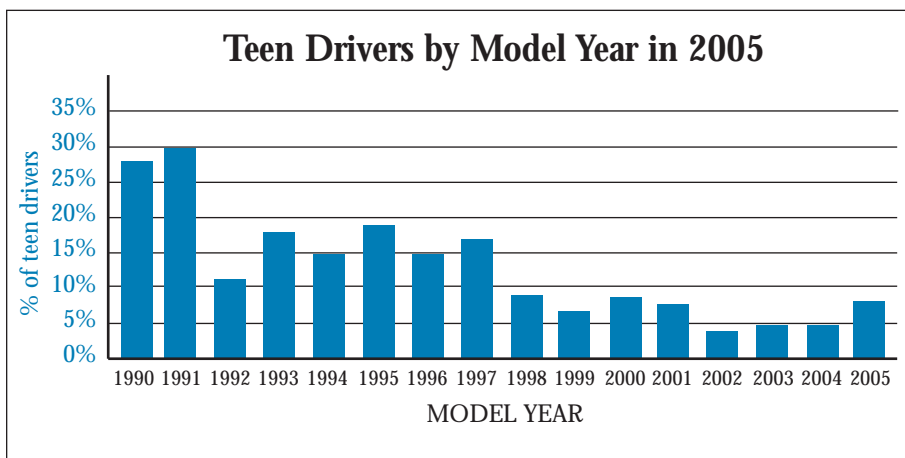
This section describes some characteristics of the vehicles involved in crashes in the PCPS study.



- The percentage of SUVs involved in PCPS crashes increased from 15% in 1999 to 26% in 2005.
- The percentage of passenger cars in PCPS crashes decreased from a high of 58% in 1999 to 47% in 2005.



- Over the past 15 years, the National Highway Traffic Safety Administration has required new safety and restraint technologies to be implemented in vehicles. (For definitions, see Page 11.)
- In 2005:
  - 44% of vehicles in PCPS were equipped with LATCH.
  - 90% had passenger airbags.
  - 78% were equipped with second-generation airbags.
  - 27% had side and/or curtain airbags.



- Teenagers driving children tend to drive the oldest vehicles that may not be equipped with up-to-date safety features.
- The percentage of teens driving vehicles model years 1990 – 1995 is 18%, compared to 6% for model years 2000 and newer.

### EXPLANATORY NOTE

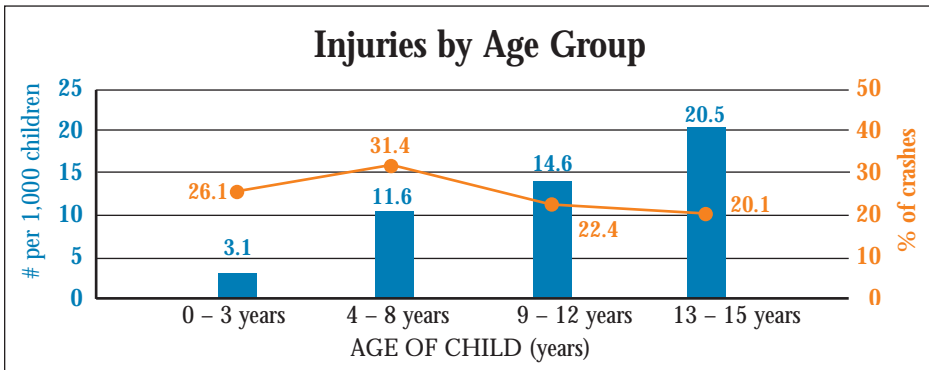
Sections 4 and 5 contain bar graphs showing the number of injuries per 1,000 children under various circumstances. The percentage of crashes in which these circumstances occurred in the overall data set are provided by the line graphs.

Injuries are defined as those that are clinically significant, including concussions and more serious brain injuries, skull fractures, facial bone fractures, spinal fractures and spinal cord injuries, injuries to internal organs, rib fractures and fractures of extremities.\* The data exclude cuts, bumps, bruises and burns.

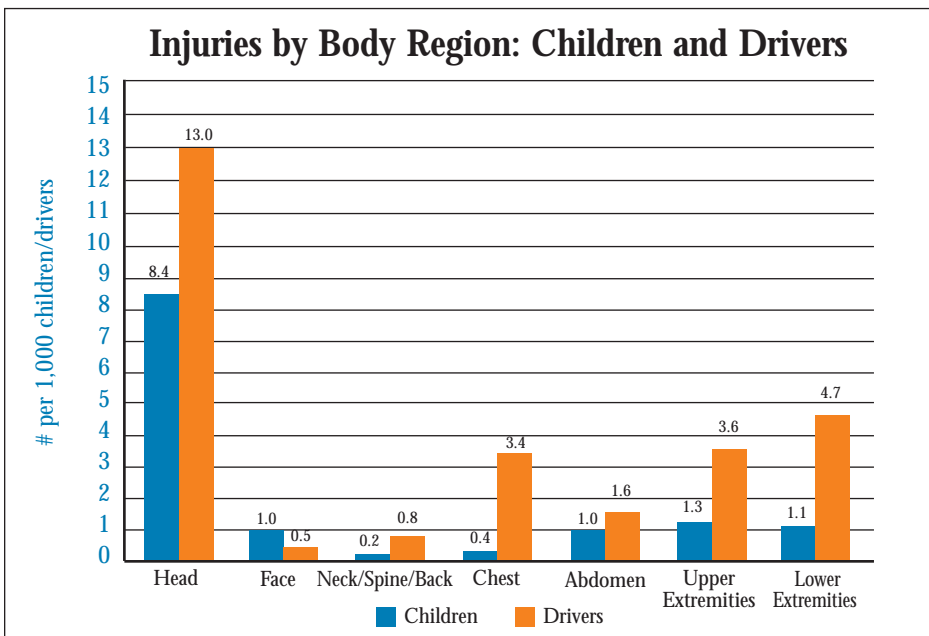
\* The definition of injury that was used in the 2005 Trend Report has changed for the 2006 report; it no longer includes facial and scalp lacerations.

## 4. PEOPLE AND INJURIES 2005

All injuries are per 1,000 children involved in crashes.

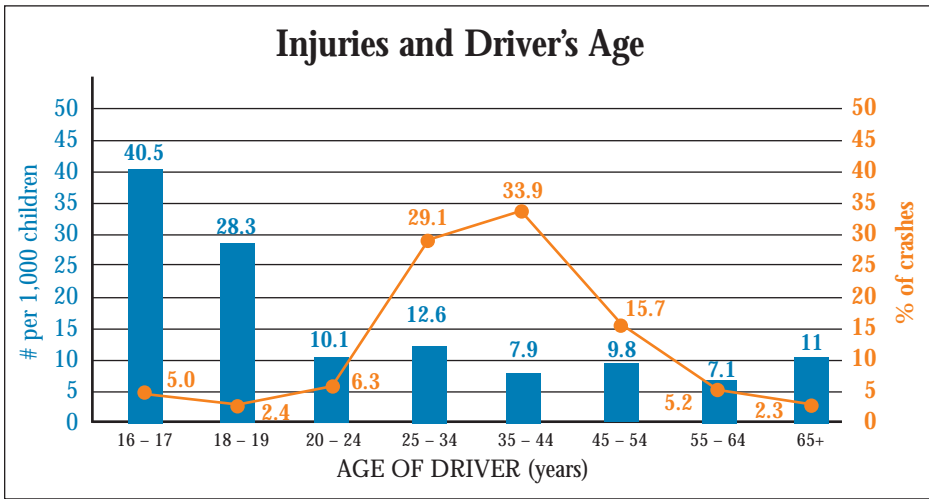


- As children age, their risk of injury in a crash rises. This is due in part to the different ways children are restrained at each age, where they sit in the vehicle, and other crash characteristics.
- While the burden of injury is highest in 13- to 15-year-olds, the percent of crashes is spread rather evenly across all age groups.

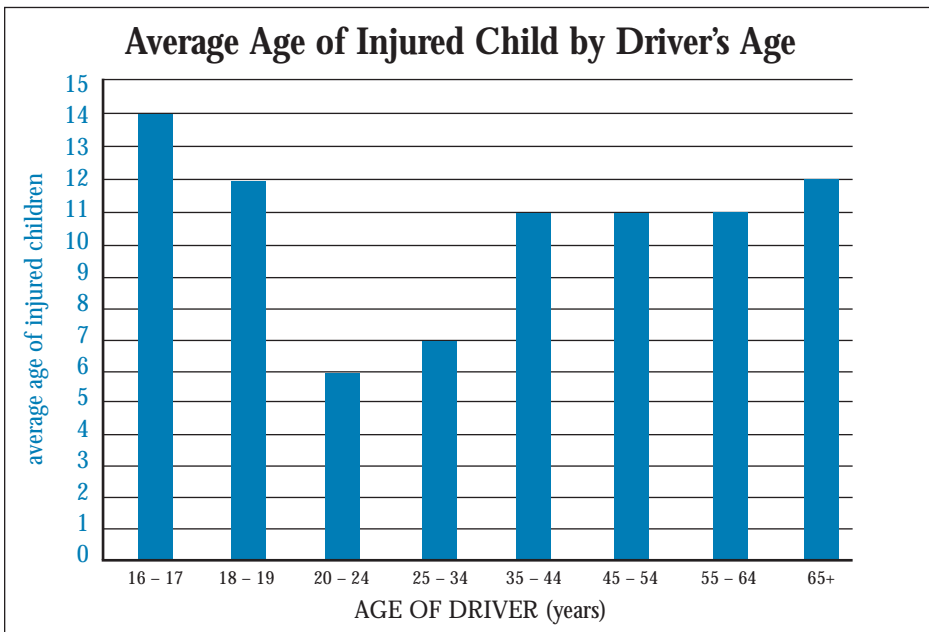


- In 2005, the overall injury risk for children involved in crashes was 11.8 per 1,000 children, approximately half the risk for drivers.
- For children and drivers, head injuries were the most common.
- 71% of the drivers were women.
- There was one child passenger in 61% of the crashes.

**All injuries are per 1,000 children involved in crashes.**



- Children have a much higher risk of injury (36.5 per 1,000) if the driver is younger than 20 years old. For drivers older than 20, the risk is 9.9 per 1,000.
- Although only 7.4% of crashes occur with drivers 16 – 19 years old, these children are 3.5 times more likely to be injured than those driven by people older than 20.



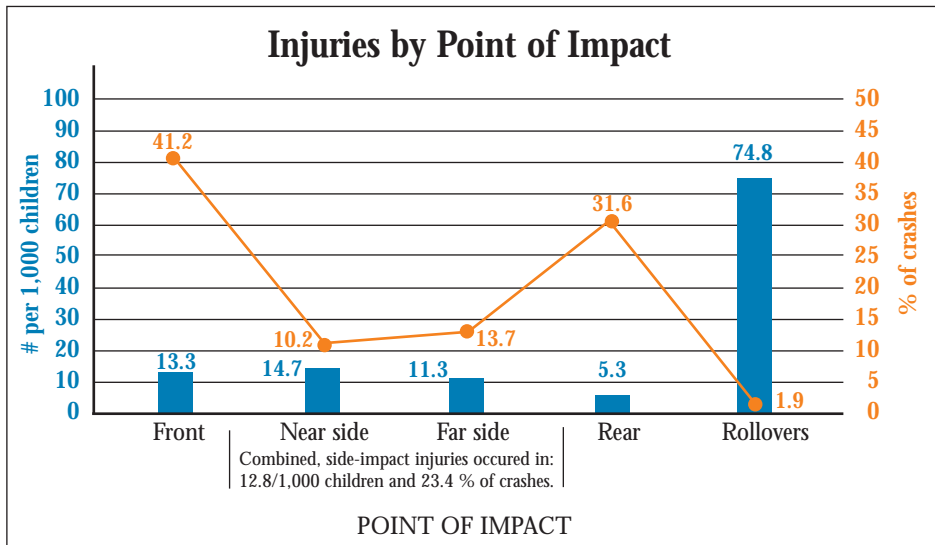
- The oldest injured children are driven by the youngest drivers.
- Crashes with drivers 20 to 34 years of age have the youngest injured children.

## 5. INJURIES AND CRASH CIRCUMSTANCES

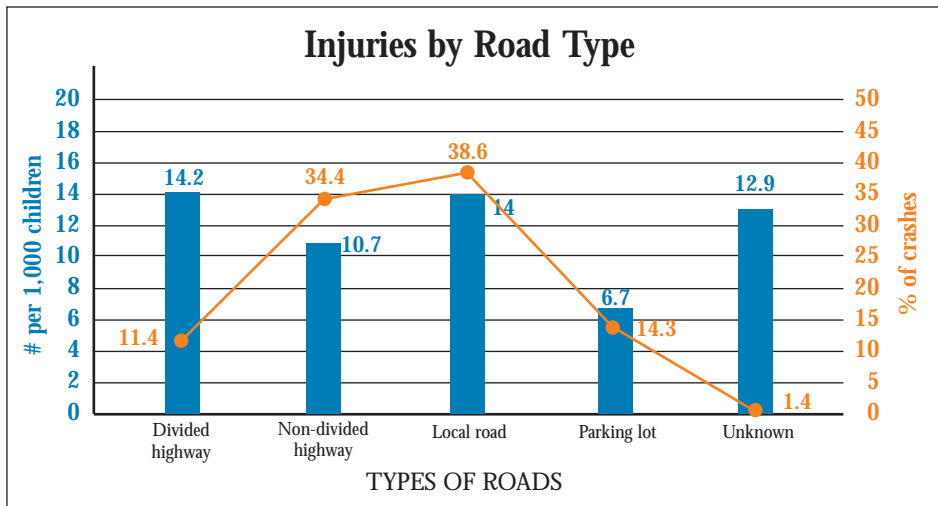
- Injuries were most common on divided highways and local roads.
- The highest risk of injuries occurred on roads with posted speed limits between 55 and 64 mph.
- Risk of injuries was highest on Mondays.
- The hours between midnight and 5:59 a.m. were the most dangerous.
- Crashes less than 20 minutes away from home had the highest risk of injury for children.

*\* See definition of injury in previous section.*

### All injuries are per 1,000 children involved in crashes.



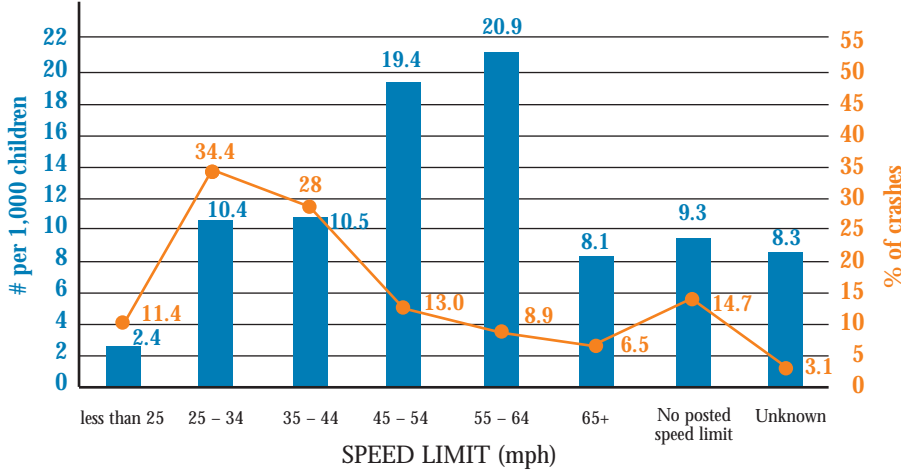
- Frontal impact crashes were most common (41.2%).
- Although rollovers occur in only 1.9% of all crashes, they have the highest risk of injury: 74.8 per 1,000 children.



- While children have a near equal risk of injury on divided highways and local roads (approximately 14 injuries per 1,000 children), crashes involving children occur three times more frequently on local roads (38.6% vs. 11.4%).

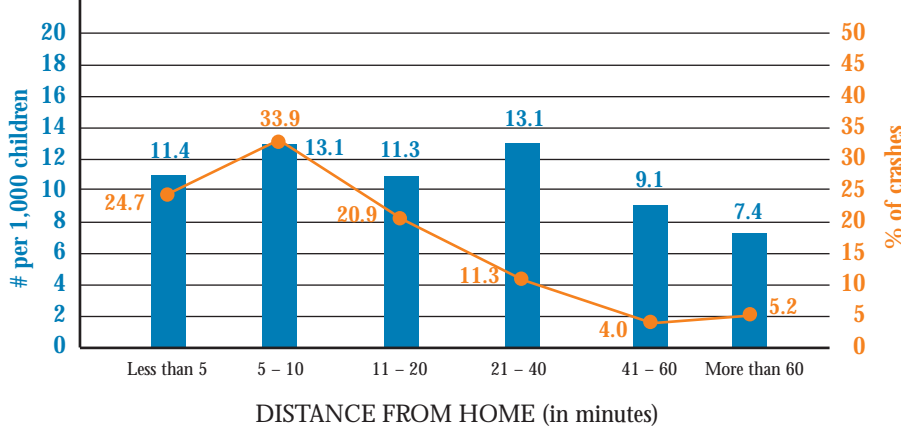


### Injuries by Speed Limit



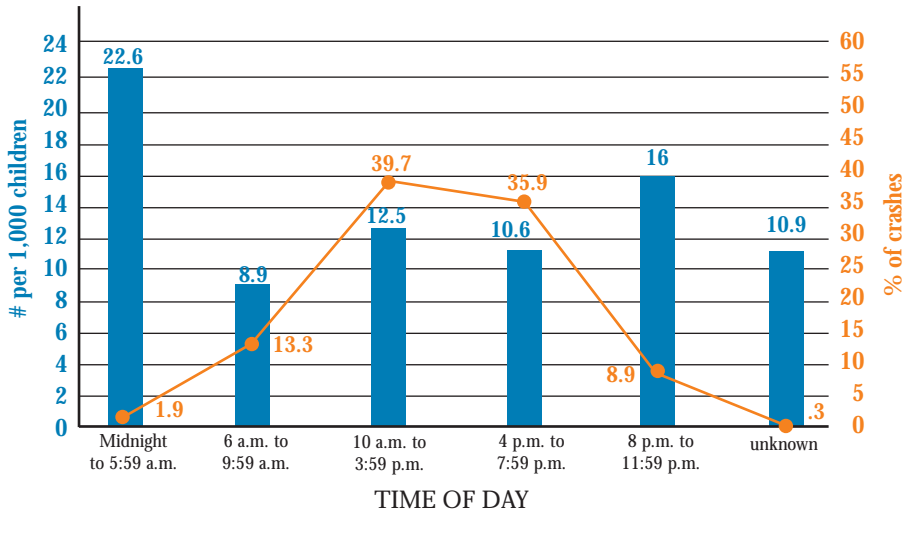
- Only 22% of crashes occur on roads with posted speed limits of 45 – 64 mph, but they account for the highest risk of injury.
- The majority (62.4%) of crashes occur on roads with posted speed limits of 25 – 44 mph.

### Injuries by Distance From Home



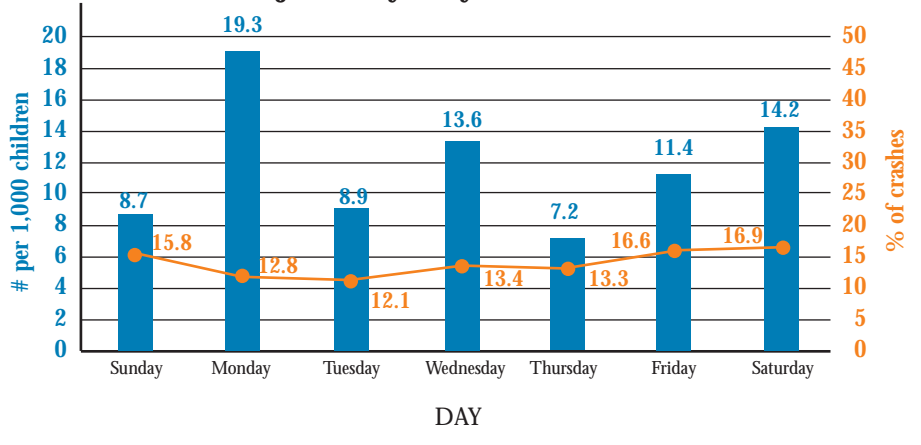
- Trips five to 10 minutes from home and those 21 to 40 minutes from home have equal numbers of injuries per 1,000 children. However, there are three times as many crashes closer to home.

### Injuries by Time of Day



- Although only 1.9% of the crashes involving children occur between midnight and 5:59 a.m., they are the most dangerous for children, with 22.6 injuries per 1,000.

### Injuries by Day of the Week



- Crashes are slightly more likely to occur on Friday and Saturday.
- Children had the highest risk of injury in crashes occurring on Mondays.

## 6. STUDY DESIGN

PCPS is a research partnership between The Children's Hospital of Philadelphia and State Farm Insurance Companies. State Farm-insured vehicles (model year 1990 or over) with child passengers younger than 16 that are involved in a crash are included in the study. Since 1998, the study has collected information from consenting State Farm Automobile Insurance policyholders.

The data included are from the District of Columbia and 16 states: Arizona, California, Delaware, Illinois, Indiana, Maryland, Michigan, Nevada, New Jersey (through November 2001), New York, North Carolina, Ohio, Pennsylvania, Texas (since June 2003), Virginia and West Virginia.

A stratified cluster sample is used to select vehicles involved in crashes for inclusion in the study. Vehicles containing children who received medical treatment are over-sampled so that the majority of those injured are selected while still representing the overall population. Those who were selected and agreed to participate took part in a 30-minute telephone interview designed to give researchers a comprehensive picture of the characteristics of the crash as well as the severity of the injuries. On-site crash investigations provide further information on injury mechanisms.

As of Dec. 31, 2005, more than 455,000 State Farm customers have participated in the study. The crashes represented in the study involved over 669,000 children. Data were collected from 29,675 in-depth interviews and more than 800 crash investigations.

## 7. ABOUT THE DATA

- The data are from Jan. 1, 2005, to Dec. 31, 2005, unless otherwise noted.
- Trend graphs cover seven years of the study through Dec. 31, 2005.
- All of the children in the PCPS study have been involved in crashes.
- The data are from an insured population; uninsured drivers may have different practices.

## 8. DEFINITIONS

**Advanced Airbag** – As of September 2006, passenger vehicles are required to have advanced airbags with sensors that automatically detect the severity of a crash and occupant size and safety belt use, and deploy front airbags with the appropriate level of power.

**Deployed airbag exposure** – A child riding in the front passenger seat at the time of a crash when an airbag deploys (goes off). Deployment of passenger airbags can cause injury to children seated in front of them.

**Far-side crash** – A side-impact crash in which a child sits on the side of the vehicle opposite the impact.

**LATCH** – An acronym that stands for “Lower Anchors and Tethers for Children.” It refers to the child restraint anchorage system for vehicles specified in the Federal Motor Vehicle Safety Standard 225 and the corresponding top tethers and lower attachment for a child restraint system identified in Standard 213.

**Near-side crash** – A side-impact crash in which a child sits on the same side of the vehicle as the impact.

**Optimal restraint** – The American Academy of Pediatrics set the following guidelines as best child restraint practices:

- Use a rear-facing seat until a child is at least 1 year and at least 20 pounds.
- Use a forward-facing seat with a harness until a child is too tall or too heavy for the seat. Generally, this is when a child weighs 40 pounds (usually around age 4).
- Use a belt-positioning booster seat until an adult seat belt fits (usually when a child's height reaches 4'9").
- For a child too big for a booster seat, use the lap-and-shoulder seat belt (usually older than age 8).
- All children younger than 13 years should sit in the back seat.

*continued on next page* ►

**Passenger airbag** – A supplemental restraint in the right front seat position, which operates best when the occupant is also using a seat belt. Airbags rapidly inflate in a collision to protect the occupant during the crash impact and help reduce the risk of serious injury to adult passengers by distributing crash forces more evenly across the occupant's body.

**Second-generation airbag** – Beginning in 1998, federal regulations changed to allow passenger airbags to deploy with less power than the first generation of airbags.

**Side-impact standard** – All passenger vehicles are required to comply with Standard 214 concerning side-impact protection. The standards were phased into the U.S. fleet beginning in 1994, with full compliance required by 1999.

*The results in this report are the interpretation solely of the Partners for Child Passenger Safety research team at The Children's Hospital of Philadelphia and are not necessarily the views of State Farm Insurance Companies.*

[www.chop.edu/carseat](http://www.chop.edu/carseat)  
[www.chop.edu/asientos\\_infantiles](http://www.chop.edu/asientos_infantiles)



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Information on child passenger safety and videos on child safety seat installation in both English and Spanish.



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Founded in 1855, The Children's Hospital of Philadelphia is the birthplace of pediatric medicine in America. Throughout its history, a passionate spirit of innovation has driven this renowned institution to pursue scientific discovery, establish the highest standards of patient care and train future leaders in pediatrics.

For a century and a half, Children's Hospital has served as a haven of hope for children and families worldwide.

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